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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,557	06/04/2001	Amaresh Pangal	884.400US1	7574
21186	7590	09/23/2004	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			DO, CHAT C	
			ART UNIT	PAPER NUMBER
			2124	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,557

Applicant(s)

PANGAL ET AL.

Examiner

Chat C. Do

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/04/01; 01/17/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/17/02; 6/4/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-7, 15, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 2, the limitation “an exponent weight of one” in line 2 is unclear whether the least significant bit of the exponent start at bit 0th or the exponent has a base of 2. For examination purposes, the examiner considers the limitation “an exponent weight of one” as an exponent in binary having a least significant bit start at bit 0th.

Re claim 3, the limitation “an exponent weight of thirty-two” in lines 2-3 is unclear whether the least significant bit of the exponent start at bit 4th or the exponent has a base of 32. For examination purposes, the examiner considers the exponent always has zero on the lower 5 bits. Claims 4, 6, 15, and 26 have the same problem.

Re claim 6, the limitation “three bit exponent field having a least significant bit weight of thirty-two” is indefinite because in order for a bit to have a weight of thirty-two, that bit must be at least at fifth position. For examination purposes, the examiner disregards this limitation in the claim.

Thus, claims 5 and 7 are also rejected for being dependent on the rejected base claims 4 and 6 respectively.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 8-9, 13-14, 18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Wyland et al. (U.S. 6,205,462).

Re claim 1, Wyland et al. disclose in Figure 2 an integrated circuit comprising: a multiplier (142) to produce a product from two floating point multiplicands (102 and 104 wherein both are floating-points and col. 1 lines 59-63) having a first exponent weight; a floating point conversion unit (140 and 144) to convert the product (output of 142) from the first exponent weight to a converted produce with a second exponent weight; an adder (148) to produce a present sum from the converted product (output of 144) and a previous sum (output of 152 as 154) having the second exponent weight; and a post-normalization unit (156) to convert the present sum to a floating point resultant having the first exponent weight.

Re claim 2, Wyland et al. further disclose in Figure 2 the multiplier is configured to produce a product with an exponent weight of one (Figure 2 wherein the exponent is in binary form or base 2).

Re claim 8, Wyland et al. further disclose in Figure 2 the post-normalization unit (156 inherently) is configured to be turned off while the adder is producing the present sum.

Re claim 9, Wyland et al. disclose in Figure 2 a floating point multiply-accumulate circuit (abstract) comprising: an exponent path (left portion of Figure 2) including: an exponent summer (140) to sum two input exponents having a first weight to produce a product exponent; an exponent conversion unit (144) coupled to the output of the exponent summer, to convert the product exponent to a second weight; and an exponent accumulation stage to choose a larger exponent from the product exponent and an accumulated exponent; and a mantissa path (right portion of Figure 2) including: a mantissa multiplier (142) to multiply two input mantissas (M1 and M2) and produce a product mantissa (output of 142 as 143); a mantissa shifter (144) to shift the product mantissa responsive to the exponent conversion unit in the exponent path; and a mantissa accumulator (148 and 152) to accumulate shifted product mantissas.

Re claim 13, Wyland et al. further disclose in Figure 2 comprising a post-normalization stage to produce a normalized floating-point resultant (156).

Re claim 14, Wyland et al. further disclose in Figure 2 the post-normalization stage (156) is configured to be turned off until accumulation is complete (inherently).

Re claim 18, it is a method of claim 1. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 20, Wyland et al. further disclose in Figure 2 accumulating the product comprises adding a first plurality of products with a last product, the method further

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comprising turning off post-normalization until the last product is accumulated (148 and 152 with feedback system).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12, 16-17, and 19 are rejected under 35 U.S.C. 103(a) as being obvious over Wyland et al. (U.S. 6,205,462) in view of Dibrino et al. (U.S. 6,542,915).

Re claims 12, 16-17, and 19, Wyland et al. do not disclose in Figure 2 the product mantissa accumulator comprises four-to-two compressors in carry-save format.

However, Dibrino et al. disclose in Figure 1B the product mantissa accumulator comprises four-to-two compressors (102 and 103) in carry-save format (102-104).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the product mantissa accumulator comprises four-to-two compressors in carry-save format as seen in Dibrino et al.'s invention into Wyland et al.'s invention because it would enable to reduce the circuitry and increase the system performance in multiplying mantissa.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 9-14, 16, and 18-26 are rejected under the judicially created doctrine of double patenting over claims 1, 3-6, 9, and 11-18 respectively of U. S. Patent No. 6,779,013 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows:

Re claim 9, it is a broader claim of claim 1 as cited in the U.S. Patent No. 6,779,013. The only limitation difference between two set of claim is "the mantissa accumulator including an overflow detection circuit responsive to two most significant bits of a sum field output from the mantissa accumulator" as cited in the claim 1.

Re claim 18, it is a broader claim of claim 11 as cited in the U.S. Patent No. 6,779,013. The only limitation difference between two set of claim is "the detecting overflow as a function of two most significant bits of a sum field of an accumulated product; and post-normalizing the accumulated product" as cited in claim 11.

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In general for all the dependent claims 10, 11, 12, 13, 14, 16, 19, 20, 21, 22, 23, 24, 25, and 26 have limitations that are very similar to claims 3, 4, 5, 6, 9, 1, 11, 12, 13, 14, 15, 16, 17, and 18 respectively of U.S. Patent No. 6,779,013.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Allowable Subject Matter

9. Claims 10-11 and 21-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. Claims 3-5, 7, 15, and 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 5,923,575 to Efrat et al. disclose a method for electronically representing a number, adder circuit and computer system.

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- b. U.S. Patent No. 5,058,048 to Gupta et al. disclose a normalizing pipelined floating point processing unit.
- c. U.S. Patent No. 6,401,194 to Nguyen et al. disclose an execution unit for processing a data stream independently and in parallel.

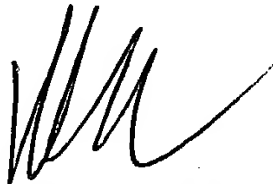
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124

September 15, 2004


ANIL KHATRI
PRIMARY EXAMINER